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haematoxylin. So much for his base of supplies. By comparison of this rich material the author proceeds to examine critically the structure of the cornu ammonis and the fascia dentata, striae Lancisii, psalterium fornix longus and fimbria, septum pellucidum and pedunculus septi pellucidi, columnae fornicis, tuber cinereum and corpus mamillare, decussatio subthalamica posterior and pedunculus corporis mamillaris, the bundle of Vicq d'Azyr and of v. Gudden, the fasciculus longitudinalis posterior, taenia thalami optici, ganglion habenulae, pedunculi conarii, Meynert's bundle (fasciculus retroflexus), taenia semicircularis and nucleus amygdalae.

The structures are treated from the purely anatomical side so that, even if we felt capable of reviewing the results, which we confess we do not, it would hardly be possible to do so in this place.

It is a valuable paper from the detail with which many of these neglected structures are discussed and the broad comparative basis which the author has for his conclusions. It is hard reading, and to this the subject matter and the style are both contributors. The phototype plates are artificially admirable, but would be aided by outline diagrams in each case, and as it is a paper for reference rather than continuous reading, an index would be a great assistance.

*The epithelium of the brain cavities.* By P. A. FISH. Proc. Am. Soc. of Microscopists. 1890. 1 plate.

The author studied the living epithelium or endyma in the brain cavities of the cat, using animals that were adults, six weeks old or newborn, and found ciliated cells in all cases. At the points of intrusion of the plexuses into the cavities, as in the paracœle (lateral ventricle), the covering cells were of the pavement form and without cilia. The discrepant statements concerning the existence of cilia of the brain cavities of adult man probably depend, as suggested, on the difficulty of obtaining really fresh material. The paper is accompanied by a useful bibliography.

*Ueber Störungen der kompensatorischen und spontanen Bewegungen nach Verletzung des Grosshirns.* A. V. KORÁNYI and J. LOEB. Archiv f. d. ges. Phys. Bd. XLVIII. 1891.

The research in question forms a further contribution to the analysis of the motor disturbances following lesion of the cerebral hemispheres in rabbits and dogs.

The first question taken up relates to the nystagmatic movements of the eyes in a rabbit fixed in the primary position upon a holder which can be revolved about a vertical axis. The direction of the nystagmus is referred to the animal, and the slower part of the oscillation is the one always designated. Upon rotating a normal rabbit, under the conditions just indicated, the nystagmus during rotation is in the opposite sense to the rotation, but when the rotation is stopped, it occurs for a short period in the same sense. In normal rabbits the direction of rotation, whether to the left or right, has no influence on the number of oscillations which are approximately the same in both cases, both during and after rotation. The authors rotated their animals ten times, then stopped the rotation and counted the number of subsequent oscillations. These were approximately the same for rotation to right or to the left in normal rabbits. When, however, the experiment was tried with rabbits from which the occipital portion of one cerebral hemisphere (always the left hemisphere in their experiments), had been removed, it was found that the direction of the rotation made a marked difference in the number of subsequent oscillations. A rabbit from which the occipital portion of the left hemisphere had been removed gave, after rotation to the right, a much larger number of subsequent oscillations than it did after rotation to the left. So too, these rabbits compensated by move-

ments of the body for rotation to the right better than for rotation to the left. During rotation to the left the rabbit must make nystagmatic movements to the right, and these were found to be more numerous when the rotation was to the left. In these cases then oscillations to right were the most readily obtained whether the animal was observed during or after rotation. It should be mentioned that when the frontal portion of the hemisphere was removed these differences in reaction were not observed.

When the lesion was made in the frontal portion of the brain, then compensatory movements were not affected. On the different effects of the lesion, according to its location, the authors lay no stress, but pass on to more general considerations. If after the injury to the brain there is a disturbance in compensatory movements—those of the eye being only one example—it must be due to a change in the irritability of the nervous mechanism involved in the reaction. This they think tends to favor the view of Goltz that “injury to the brain causes a decrease in the irritability of the lower centres in the spinal cord.” In general they determined a greater tension in the trunk muscles on the side opposite to the lesion, but the explanation of this observation is not given.

*The ear of man: its past, present and future—Lecture IX. in the Biological lectures delivered at the Marine Biological Laboratory of Wood's Holl in the summer session of 1890. Boston, Ginn & Co., 1891.*

This lecture contains a general presentation of some observations on the morphology of the vertebrate ear coupled with some remarks on its physiology. The morphological portion is to appear more in detail in an early number of the *Journal of Morphology*. The author argues that the internal ear is derived by modification from the organs of the lateral line, and that it is to be regarded as representing two sense organs, one indicated by the utricle and the other by the saccule, each with a system of semicircular canals. Taking his departure from Allis' paper on the development of the lateral line organs in the fish, he shows how from the first sinking in of the auditory pit to the full development of mammalian ear, the process is parallel to that which takes place in the organs of the lateral line. When thus regarded, the Cyclostome ear—which has been a stumbling block to the comparative anatomists—appears as a simpler and less developed ear rather than an aberrant or degenerate one. The double nature of the organ is suggested by the double nerve supply—by what in the higher forms are considered the two branches of the auditory nerve—and by the fact that, considered schematically, the organ may be divided into equivalent portions, using the prolongation of the ductus endolymphaticus as an axis. If we accredit the anterior and horizontal canals to the utricle we have the same number of groups of sensory cells as in the saccule and its appendages. To be sure the latter has but one canal—the posterior, with its proper crista—but it also contains the *macula acustica neglecta* of Retzius, which, if the canal belonging to it had developed, would have established the numerical symmetry that the scheme demands. In speaking of the physiology the author lays much stress on the contradictions among the older authors who have investigated the semicircular canals and does not utilize the recent results like those of Delarge and Breuer, which are, if anything, more important.

*Die Kopfnerven von Salamandra maculata im vorgerückten embryonalstadium untersucht. Von Baron Jos. von Plessen und Dr. Med. JOHN RABINOVICZ. Mit 2 lithographischen doppeltefeln und 4 Zinkographien im Text. München, J. F. Lehmann, 1891.*

The plates in this paper are from the sections reconstructed after the method of His and are very instructive. In this salamander the troch-